DOCUMENT RESUME

ED 443 029 CE 080 487

TITLE	Illinois Occupational Skill Standards: Metal Stamping Skills Cluster.
INSTITUTION	Illinois Occupational Skill Standards and Credentialing Council, Carbondale.
SPONS AGENCY	Illinois State Board of Education, Springfield.
PUB DATE	1998-08-00
NOTE	55p.; For other Illinois Occupational Skill Standards, see CE 080 475-492.
AVAILABLE FROM	Curriculum Publications Clearinghouse, Western Illinois University, Horrabin Hall 46, 1 University Circle, Macomb, IL 61455-1390, Tel: 800-322-3905, Fax: 309-298-2869, e-mail: CPC@wiu.edu (#512b, $4). For full text: http://www.standards.siu.edu/pdf/manufacturing/stamping.pdf.
PUB TYPE	Guides - Non-Classroom (055) -- Legal/Legislative/Regulatory Materials (090)
EDRS PRICE	MF01/PC03 Plus Postage.
DESCRIPTORS	*Academic Standards; Behavioral Objectives; Competence; Competency Based Education; Educational Objectives; Employment Potential; Evaluation Criteria; *Job Skills; Job Training; *Metal Industry; *Metal Working; Occupational Clusters; *Performance Based Assessment; Postsecondary Education; Program Guides; Secondary Education; *State Standards; Statewide Planning; Student Certification; Student Evaluation; Trade and Industrial Education; Vocational Education
IDENTIFIERS	*Illinois

ABSTRACT

These skill standards, developed through a consortium of educational and industry partners in Illinois, serve as guides to workforce preparation program providers to define content for their programs and to employers to establish the skills and standards necessary for job acquisition and performance. The skill standards include the following components for each skill defined: performance area; performance skill; skill standard; and performance elements and assessment criteria. This publication contains skill standards for metal stamping occupations. The skill standards are grouped in the following areas: (1) quality control and inspection; (2) operation; (3) preventive maintenance; (4) quality control and inspection; and (5) set-up operations. Each area contains 1-14 standards. The following items are appended: glossary; lists of Illinois Occupational Skill Standards and Credentialing Council and Manufacturing Subcouncil members; Manufacturing Subcouncil Metal Stamping Skills Cluster Recognition Proposal; and a list of workplace skills. (KC)

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ILLINOIS

OCCUPATIONAL SKILL STANDARDS

METAL STAMPING SKILLS CLUSTER

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ILLINOIS OCCUPATIONAL SKILL STANDARDS
METAL STAMPING SKILLS CLUSTER

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ILLINOIS OCCUPATIONAL SKILL STANDARDS

METAL STAMPING SKILLS CLUSTER

Adapted from the
National Metal Stamping Skill Standards
and
Endorsed for Illinois
by the
Illinois Occupational Skill Standards and Credentialing Council

MESSAGE TO ILLINOIS CITIZENS

Dear Citizens of Illinois:

Preparing youth and adults to enter the workforce and to be able to contribute to society throughout their lives are critical to the economy of Illinois. Public and private interest in establishing national and state systems of industry-driven skill standards and credentials is growing in the United States, especially for occupations that require less than a four-year college degree. This interest stems from the understanding that the United States will increasingly compete internationally and the need to increase the skills and productivity of the front-line workforce. The major purposes of skill standards and credentialing systems are to promote education and training investment and ensure that this education and training enable students and workers to meet industry standards that are benchmarked to our major international competitors.

The Illinois Occupational Skill Standards and Credentialing Council (IOSSCC) has been working with industry subcouncils, the Illinois State Board of Education and other partnering agencies to adopt, adapt and/or develop skill standards for high-demand occupations. This document represents the work of the Manufacturing Subcouncil and the associated standards development committee. Through this collaborative effort, skill standards products are being developed for a myriad of industries, occupational clusters and occupations. Upon completion of these products, there will be a period of feedback and comment from business, industry and labor representatives, as well as educators.

These documents will serve as guides to workforce preparation program providers to define content for their programs and to employers to establish the skills and standards necessary for job acquisition. These standards will also serve as a mechanism for communication among education, business, industry and labor.

We encourage you to review these standards and share your comments. This effort has involved a great many people from business, industry and labor. Comments regarding their usefulness in curriculum and assessment design, as well as your needs for inservice and technical assistance in their implementation, are critical to our efforts to move forward and improve the documents. A feedback instrument is included with this document.

Questions concerning this document may be directed to:

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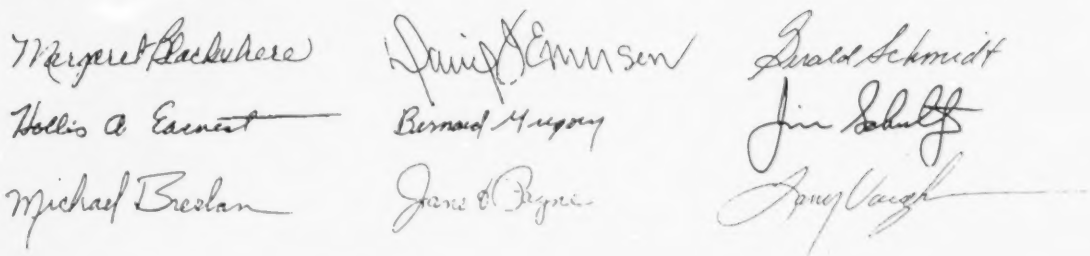
We look forward to your comments.

Sincerely,

The Members of the IOSSCC



THE ILLINOIS PERSPECTIVE

The Illinois Occupational Skill Standards and Credentialing Council (IOSSCC) endorses occupational skill standards and credentialing systems for occupations that (a) require basic workplace skills and technical training, (b) provide a large number of jobs with either moderate or high earnings, and (c) provide career advancement opportunities to related occupations with moderate or high earnings. The nine-member Council was established by the Occupational Skill Standards Act (PA 87-1210). The council, representing business, industry and labor and working with the Illinois State Board of Education in partnership with the Illinois Community College Board, Illinois Board of Higher Education, Illinois Department of Employment Security and Illinois Department of Commerce and Community Affairs, has created a common vision for workforce development in Illinois.

Vision

It is the vision of the IOSSCC to develop a statewide system of industry-defined and recognized skill standards and credentials for all major skilled occupations providing strong employment and earnings opportunities in Illinois. Information related to occupational employment and earning opportunities is determined by the Illinois Occupational Information Coordinating Committee (IOICC) in cooperation with business and industry.

Subcouncils and Standards Development Committees

The Council developed industry subcouncils (representing all major industries in Illinois) to review, approve and promote occupational skill standards and credentialing systems. In cooperation with organizations such as the Illinois Chamber of Commerce, the Illinois AFL-CIO, the Illinois Manufacturers' Association and others, the Council established the first five subcouncils in 1995—Agricultural and Natural Resources, Manufacturing, Health and Social Services, Hospitality, and Business and Administrative/Information Services.

The remaining subcouncils include Applied Science and Engineering Services; Legal and Protective Services; Transportation, Distribution and Logistics; Educational Services; Financial Services; Marketing and Retail Trade; Communications; Construction; and Energy and Utilities.

The Standards Development Committees, composed of business, labor and education representatives, are experts in the related occupational cluster and work with the product developer to

- develop or validate occupational skill standards,
- identify related academic skills,
- develop or review assessment or credentialing approaches, and
- recommend endorsement of the standards and credentialing system to the industry subcouncil.

Expected Benefits for Employers, Educators, Students and Workers

Occupational skill standards and credentialing systems are being developed and promoted by the IOSSCC to improve Illinois' competitiveness. Such standards and credentialing systems provide a common language for employers, workers, students and education and training providers to communicate skill requirements and quality expectations for all major industry and occupational areas.

For Employers, skill standards will

- Improve employee recruitment and retention by more clearly identifying skill requirements,
- Encourage improved responsiveness and performance of education and training providers,
- Enlarge the pool of skilled workers,
- Focus attention on the importance of training investment.

For Education and Training Providers, skill standards will

- Provide information on all major industries and occupations,
- Contribute to program and curriculum development,
- Strengthen relationships between educators and training providers,
- Improve career planning.

For Students and Workers, skill standards will

- Foster better decision making concerning careers and the training necessary to acquire well-paying jobs,
- Allow more effective communication with employers about what they know and can do,
- Allow more effective work with employers in career development and skill upgrading.

IOSSCC Requirements for Occupational Skill Standards

Any occupational skill standards and credentialing system seeking IOSSCC endorsement must

- represent an occupation or occupational cluster which meets the criteria for IOSSCC endorsement;
- address both content and performance standards for critical work functions and activities for an occupation or occupational area;
- ensure formal validation and endorsement by a representative group of employers and workers within an industry;
- provide for review, modification and revalidation by an industry group a minimum of once every five years;
- award credentials based on assessment approaches that are supported and endorsed by the industry and consistent with nationally recognized guidelines for validity and reliability;
- provide widespread access and information to the general public in Illinois;
- include marketing and promotion by the industry in cooperation with the partner state agencies.

Definitions and Endorsement Criteria

The definitions and endorsement criteria are designed to promote the integration of existing and future industry-recognized standards, as well as the integration of the Illinois academic and occupational skill standards. Because all skill standards must address the critical work functions and activities for an occupation or industry/occupational area, the Council further defined three major components:

- ***Conditions of Performance***: The information, tools, equipment and other resources provided to a person for a work performance.
- ***Statement of Work***: A description of the work to be performed by a person.
- ***Performance Criteria***: The criteria used to determine the required level of performance. These criteria could include product characteristics (e.g., accuracy levels, appearance), process or procedural requirements (e.g., safety, standard professional procedures) and time and resource requirements. The IOSSCC also requires performance criteria to be further specified by detailed individual performance elements and assessment criteria.

The IOSSCC is currently working with the Illinois State Board of Education and other state agencies to integrate the occupational standards with the Illinois Learning Standards which describe what students should know and be able to do as a result of their education. The Council is also working to integrate workplace skills—problem solving, critical thinking, teamwork, etc.—with both the Learning Standards and the Occupational Skill Standards.

The Illinois Model

Illinois Occupational Skill Standards describe what people should know and be able to do and how well these skills and knowledge will be demonstrated in an occupational setting. They focus on the most critical work performances for an occupation or occupational area. As seen in the following model, Illinois Occupational Skill Standards contain at least these areas:

- Performance Area
- Performance Skill
- Skill Standard
- Performance Elements and Assessment Criteria

The Assessment and Credentialing Approach section may also be included at the direction of the individual standards development committee.

Illinois Occupational Skill Standards also carry a coding at the top of each page identifying the state, fiscal year in which standards were endorsed, subcouncil abbreviation, cluster abbreviation and standard number. For example, the twenty-fifth skill standard in the Metal Stamping Skills Cluster, which has been developed by the Manufacturing Subcouncil, would carry the following coding: IL.97.MFG.STMP.25

A model for Illinois Occupational Skill Standards showing the placement of the coding and providing a description of each area within a standard is contained on the following page.

SUMMARY OF WORK TO BE PERFORMED. SUMMARY IS BRIEF AND BEGINS WITH AN ACTION VERB.

IL. FY. SUBCOUNCIL. CLUSTER. STANDARD NO.

PERFORMANCE AREA

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Includes all information, tools, equipment and other resources provided to the learner for performing the work.

WORK TO BE PERFORMED

Provides an overview of the performance with the major elements or steps being described under Performance Elements and Assessment Criteria.

PERFORMANCE CRITERIA

Includes product characteristics (e.g., accuracy levels, appearance) and/or process or procedure requirements (e.g., safety requirements). Time limits, rates and/or speeds are specified in the Performance Criteria.

PERFORMANCE ELEMENTS AND ASSESSMENT CRITERIA

Statement of the major elements, components or steps of the overall performance and the assessment criteria for determining successful performance. Includes all major tasks, the knowledge to be demonstrated and specific assessment criteria.

ASSESSMENT AND CREDENTIALING APPROACH

Optional statement of suggested assessment approaches for the performance which also refers to existing assessment and credentialing systems.

DEVELOPMENTAL PROCESS

The Manufacturing Subcouncil identified metal stamping skills as a major occupational cluster in manufacturing. Metal stamping refers to a broad range of metalworking operations such as shearing, piercing, punching and staking, as well as forming operations such as braking and drawing. These operations may be performed using manual equipment or complex progressive die sets mounted in presses. Metal stamping skills include planning, setup and verification of proper operation and production of semi-finished and finished goods. Although there are many different types of stamping presses in the industry, skill differences are determined by the types of tooling and ancillary devices used in the stamping process.

The National Institute for Metalworking Skills (NIMS) has developed national standards for two levels of stamping skills. NIMS is composed of a board representing metal-working-related companies, trade associations and labor unions. The National Institute for Metalworking Skills developed the national standards through a nationwide validation process that included regional technical work groups and national surveys.

In Illinois, the national metal stamping skill standards were reformatted to meet the requirements of the Illinois Occupational Skill Standards and Credentialing Council (IOSSCC). The Manufacturing Subcouncil established a standards development committee to review and approve the reformatted national metal stamping standards. A copy of the reformatted standards and a survey instrument were sent to the standards development committee members. The survey returns recommended endorsement of the national metal stamping standards and approved the reformatting. The Manufacturing Subcouncil and IOSSCC then voted to endorse the national standards as formatted.

The IOSSCC-recognized standards will be referred to as the "Illinois Stamping Skill Standards adapted from the National Metal Stamping Skill Standards to meet the format requirements of the Illinois Occupational Skill Standards and Credentialing Council."

ASSUMPTIONS FOR METAL STAMPING SKILLS CLUSTER

Skill standards statements assume:

1. Workplace skills (employability skills) are expected of all learners. Socialization skills needed for work are related to lifelong career experience and are not solely a part of the initial schooling process. These are not included with this set of statements.
2. Specific policies and procedures of the worksite will be made known to the learner and will be followed.
3. Skills progress from simple to complex. Once a skill has been successfully performed, it will be incorporated into more complex skills.
4. Skill standards describe the skill only and do not detail the background knowledge or theory related to the particular skill base. Although the skill standard enumerates steps to successful demonstration, rote approaches to the outcomes are not prescribed.
5. The Metal Stamping Skills Cluster includes Levels II and III. Machining Level I is considered foundational for many metal working occupations including stamping. Machining Level I will serve as the beginning level until a more appropriate Level I can be identified and developed. Contact the National Institute for Metalworking Skills at 703/352-4971 for information regarding Metal Stamping Level I.
6. The time it takes to complete some standards will vary depending on the complexity of the piece being manufactured. The time of 60 minutes has been used as a place holder throughout the Metal Stamping standards to indicate that time is important to the performance of that particular skill. Contact the National Institute for Metalworking Skills at 703/352-4971 for current information regarding drawings, equipment list, appropriate time requirements and assessment procedures.
7. The English system of measurement was used in the metalworking skill standards unless otherwise indicated.

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INSPECT PARTS USING AN OPTICAL COMPARATOR.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given a finished part, process plan, blueprint and access to the following:

Optical comparator
Tooling appropriate to the presentation of a part on an optical comparator
Precision tools and gages needed to operate the comparator
Appropriate drafting supplies and equipment
Vellum or tracing paper
Machinery's Handbook

WORK TO BE PERFORMED

Inspect a part's specified profiles. Produce data necessary to describe the compliance of the profiles.

PERFORMANCE CRITERIA

The inspection report satisfies the elements of the model report. Appropriate techniques were used to gather the data for the report. Paperwork is complete. Housekeeping is accomplished. Safe practices are used. The time standard is met.

PERFORMANCE ELEMENTS AND ASSESSMENT CRITERIA

- The inspection report findings match the findings of the model inspection report.
- Appropriate trade techniques are used to produce the inspection findings.
- All relevant paperwork is completed and in order.
- The work area is returned to a neat and clean state.
- The time standard is met. The time limit is 60 minutes.
- Safe practices are used throughout the performance.

MONITOR PROCESS, RECORD REQUIRED PRODUCTION DATA AND RESPOND TO PROBLEMS.

OPERATION

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given a setup verified for safety, correct operation of tooling and waste management and access to the following equipment and materials:

- Appropriate press
- Sheet stock from work in process
- Tongs
- Magnets
- Suction cups
- Clamps
- Dies
- Rules
- Micrometers
- Vermiers
- Squares
- Specialty gages
- Attribute gages
- Machinery's Handbook

WORK TO BE PERFORMED

Perform the monitoring plan and respond to its requirements while performing the production run.

PERFORMANCE CRITERIA

The monitoring and production data reports satisfy the elements of the model reports. Appropriate techniques were used to gather the data for the reports. Discrepancies are responded to appropriately. Paperwork is complete; housekeeping is accomplished. Safe practices are used, and the time standard is met.

PERFORMANCE ELEMENTS AND ASSESSMENT CRITERIA

- The findings of the monitoring and data reports match the findings of the model process reports.
- The candidate can successfully answer relevant questions regarding the reports.
- Appropriate trade techniques are used to produce the inspection findings.
- Problems are addressed appropriately.
- All relevant paperwork is completed and is in order.
- The work area is returned to a neat and clean state.
- The time standard is met. The time limit is 60 minutes.
- Safe practices are used throughout the performance.

SELECT, LOAD AND RESTART MATERIALS.

OPERATION

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given a setup in production verified for safety and access to the following:

- Appropriate press
- Stock selected for production
- Tongs
- Magnets
- Suction cups
- Rules
- Micrometers
- Verniers
- Squares
- Specialty gages
- Attribute gages

WORK TO BE PERFORMED

Select, load and place a new batch of materials back into production.

PERFORMANCE CRITERIA

Material meeting specifications is loaded, and the production run is restarted. Restart, production and safety practices are appropriate. Paperwork is completed, and the time standard is met.

PERFORMANCE ELEMENTS AND ASSESSMENT CRITERIA

- The material meets specifications.
- Appropriate trade techniques are used to reload and restart the materials.
- All relevant paperwork is completed and is in order.
- The work area is returned to a neat and clean state.
- The time standard is met. The time limit is 60 minutes.
- Safe practices are used throughout the performance.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given an operation to be performed and access to the following:

- Appropriate press
- Stock selected for production
- Tongs
- Magnets
- Suction cups
- Rules
- Micrometers
- Verniers
- Squares
- Specialty gages
- Attribute gages
- Process plan

WORK TO BE PERFORMED

Adjust straighteners to present the stock to enter, flow through and exit the tooling in the most efficient manner.

PERFORMANCE CRITERIA

The stock flows smoothly through the straighteners and into the tooling. Production and safety practices are appropriate. Paperwork is completed, and the time standard is met.

PERFORMANCE ELEMENTS AND ASSESSMENT CRITERIA

- **The material passes through the straighteners smoothly with a straight profile.**
- **Appropriate trade techniques are used to adjust the straighteners.**
- **All relevant paperwork is completed and is in order.**
- **The work area is returned to a neat and clean state.**
- **The time standard is met. The time limit is 60 minutes.**
- **Safe practices are used throughout the performance.**

ADJUST FEEDERS.

OPERATION

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given a setup to be performed and access to the following:

- Stock selected for production
- Tongs
- Magnets
- Suction cups
- Rules
- Micrometers
- Verniers
- Squares
- Specialty gages
- Attribute gages
- Process plan

WORK TO BE PERFORMED

Adjust feeders to advance the stock at the correct pitch to match the requirements of the tooling.

PERFORMANCE CRITERIA

The stock advances into the tooling so that it matches the pitch of the tooling. Production and safety practices are appropriate. Paperwork is completed, and the time standard is met.

PERFORMANCE ELEMENTS AND ASSESSMENT CRITERIA

- The feeders are adjusted to advance the material at the pitch required by the tooling.
- Appropriate trade techniques are used to adjust the feeders.
- All relevant paperwork is completed and is in order.
- The work area is returned to a neat and clean state.
- The time standard is met. The time limit is 60 minutes.
- Safe practices are used throughout the performance.

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ADJUST CRADLES AND REELS.

OPERATION

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given a setup to perform and access to the following:

- Appropriate press
- Stock selected for production
- Tongs
- Magnets
- Suction cups
- Rules
- Micrometers
- Verniers
- Squares
- Specialty gages
- Attribute gages
- Process Plan

WORK TO BE PERFORMED

Adjust a cradle or payout reel to pay out material at a rate that enables smooth and continuous production.

PERFORMANCE CRITERIA

The stock is paid out so that the material is able to flow through in a smooth and continuous manner. Production and safety practices are appropriate. Paperwork is completed, and the time standard is met.

PERFORMANCE ELEMENTS AND ASSESSMENT CRITERIA

- Cradles and reels are adjusted to enable the smooth and continuous payout of material.
- Appropriate trade techniques are used to adjust the cradles and reels.
- All relevant paperwork is completed and is in order.
- The work area is returned to a neat and clean state.
- The time standard is met. The time limit is 60 minutes.
- Safe practices are used throughout the performance.

ADJUST CONVEYORS, MAGAZINES, TAKE-UP REELS AND UNLOADERS.

OPERATION

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given a setup to perform and access to the following:

- Appropriate press
- Stock selected for production
- Conveyors, take-up reels, magazines and unloaders
- Tongs
- Magnets
- Suction cups
- Rules
- Micrometers
- Verniers
- Squares
- Specialty gages
- Attribute gages
- Process plan

WORK TO BE PERFORMED

Adjust conveyors, take-up reels, magazines and unloaders to handle the output of tooling so that the parts produced are kept from unwarranted post-production damage and scrap material is segregated into appropriate storage containers.

PERFORMANCE CRITERIA

Conveyors, take-up reels, magazines and unloaders are adjusted to minimize any post-production damage. They are adjusted to segregate product and scrap material into the appropriate containers. Production and safety practices are appropriate. Paperwork is completed, and the time standard is met.

PERFORMANCE ELEMENTS AND ASSESSMENT CRITERIA

- Conveyors, take-up reels, magazines and unloaders are adjusted to minimize post-production damage to product.
- Conveyors, take-up reels, magazines and unloaders are adjusted to segregate the product and scrap into appropriate containers.
- Appropriate trade techniques are used to adjust the conveyors, take-up reels, magazines and unloaders.
- All relevant paperwork is completed and is in order.
- The work area is returned to a neat and clean state.
- The time standard is met. The time limit is 60 minutes.
- Safe practices are used throughout the performance.

OPERATE MACHINES WITH SINGLE-HIT DIE TOOLING.

OPERATION

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given a setup in production with single-hit tooling verified for safety, as well as access to the following:

- Appropriate press
- Stock selected for production
- Adjusted conveyors, take-up reels, magazines and unloaders
- Tongs
- Magnets
- Suction cups
- Rules
- Micrometers
- Verniers
- Squares
- Specialty gages
- Attribute gages
- Process plan

WORK TO BE PERFORMED

Produce parts in the manner prescribed by the process plan.

PERFORMANCE CRITERIA

The parts meet specifications. Production and safety practices are appropriate. Paperwork is completed, and the time standard is met.

PERFORMANCE ELEMENTS AND ASSESSMENT CRITERIA

- **The parts are produced to specifications.**
- **Appropriate trade techniques are used to produce the parts.**
- **All relevant paperwork is completed and is in order.**
- **The work area is returned to a neat and clean state.**
- **The time standard is met. The time limit is 60 minutes.**
- **Safe practices are used throughout the performance.**

OPERATE MACHINES WITH COMPOUND DIE SETS.

OPERATION

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given a setup in production using compound dies and verified for safety, as well as access to the following:

- Appropriate press
- Stock selected for production
- Tongs
- Magnets
- Suction cups
- Rules
- Micrometers
- Verniers
- Squares
- Specialty gages
- Attribute gages
- Process plan

WORK TO BE PERFORMED

Produce parts in the manner prescribed by the process plan.

PERFORMANCE CRITERIA

The parts meet specifications. Production and safety practices are appropriate. Paperwork is completed, and the time standard is met.

PERFORMANCE ELEMENTS AND ASSESSMENT CRITERIA

- The parts are produced to specification.
- Appropriate trade techniques are used to produce the parts.
- All relevant paperwork is completed and is in order.
- The work area is returned to a neat and clean state.
- The time standard is met. The time limit is 60 minutes.
- Safe practices are used throughout the performance.

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OPERATE MACHINES WITH NON-SENSORED PROGRESSIVE DIE SETS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given a setup in production using non-sensored progressive dies and verified for safety, as well as access to the following:

- Appropriate press
- Stock selected for production
- Tongs
- Magnets
- Suction cups
- Rules
- Micrometers
- Verniers
- Squares
- Specialty gages
- Attribute gages
- Process plan

WORK TO BE PERFORMED

Produce parts in the manner prescribed by the process plan.

PERFORMANCE CRITERIA

Paperwork is completed, and the time standard is met. The parts meet specifications. Production and safety practices are appropriate.

PERFORMANCE ELEMENTS AND ASSESSMENT CRITERIA

- The parts are produced to specifications.
- Appropriate trade techniques are used to produce the parts.
- All relevant paperwork is completed and is in order.
- The work area is returned to a neat and clean state.
- The time standard is met. The time limit is 60 minutes.
- Safe practices are used throughout the performance.

OPERATE MACHINES WITH SENSORED PROGRESSIVE DIES.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given a setup in production using sensored progressive dies and verified for safety, as well as access to the following:

- Appropriate press
- Stock selected for production
- Tongs
- Magnets
- Suction cups
- Rules
- Micrometers
- Verniers
- Squares
- Specialty gages
- Attribute gages
- Process plan

WORK TO BE PERFORMED

Produce parts in the manner prescribed by the process plan.

PERFORMANCE CRITERIA

The parts meet specifications. Production and safety practices are appropriate. Paperwork is completed, and the time standard is met.

PERFORMANCE ELEMENTS AND ASSESSMENT CRITERIA

- The parts are produced to specifications.
- Appropriate trade techniques are used to produce the parts.
- All relevant paperwork is completed and is in order.
- The work area is returned to a neat and clean state.
- The time standard is met. The time limit is 60 minutes.
- Safe practices are used throughout the performance.

OPERATE MACHINES WITH TRANSFER DIES.

OPERATION

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given a setup in production using transfer dies and verified for safety, as well as access to the following:

- Appropriate press
- Stock selected for production
- Tongs
- Magnets
- Suction cups
- Rules
- Micrometers
- Verniers
- Squares
- Specialty gages
- Attribute gages
- Process plan

WORK TO BE PERFORMED

Produce parts in the manner prescribed by the process plan.

PERFORMANCE CRITERIA

The parts meet specifications. Production and safety practices are appropriate. Paperwork is completed, and the time standard is met.

PERFORMANCE ELEMENTS AND ASSESSMENT CRITERIA

- **The parts are produced to specifications.**
- **Appropriate trade techniques are used to produce the parts.**
- **All relevant paperwork is completed and is in order.**
- **The work area is returned to a neat and clean state.**
- **The time standard is met. The time limit is 60 minutes.**
- **Safe practices are used throughout the performance.**

OPERATE MACHINES WITH SINGLE DEEP-DRAWING OPERATIONS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given a setup in production that is performing single deep-drawing operations and is verified for safety, as well as access to the following:

- Appropriate press
- Stock selected for production
- Tongs
- Magnets
- Suction cups
- Rules
- Micrometers
- Verniers
- Squares
- Specialty gages
- Attribute gages
- Process plan

WORK TO BE PERFORMED

Produce parts in the manner prescribed by the process plan.

PERFORMANCE CRITERIA

The parts meet specifications, and production and safety practices are appropriate. Paperwork is completed, and the time standard is met.

PERFORMANCE ELEMENTS AND ASSESSMENT CRITERIA

- The parts are produced to specifications.
- Appropriate trade techniques are used to produce the parts.
- All relevant paperwork is completed and is in order.
- The work area is returned to a neat and clean state.
- The time standard is met. The time limit is 60 minutes.
- Safe practices are used throughout the performance.

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OPERATE MACHINES WITH DOUBLE DEEP-DRAWING OPERATIONS.

OPERATION

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given a setup in production that is performing double deep-drawing operations and is verified for safety, as well as the following:

Appropriate press
Stock selected for production
Tongs
Magnets
Suction cups
Rules
Micrometers
Verniers
Squares
Specialty gages
Attribute gages
Process plan

WORK TO BE PERFORMED

Produce parts in the manner prescribed by the process plan.

PERFORMANCE CRITERIA

The parts meet specifications, and production and safety practices are appropriate. Paperwork is completed, and the time standard is met.

PERFORMANCE ELEMENTS AND ASSESSMENT CRITERIA

- The parts are produced to specifications.
- Appropriate trade techniques are used to produce the parts.
- All relevant paperwork is completed and is in order.
- The work area is returned to a neat and clean state.
- The time standard is met. The time limit is 60 minutes.
- Safe practices are used throughout the performance.

OPERATE MACHINES WITH REVERSE DEEP-DRAWING OPERATIONS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given a setup in production that is performing reverse deep-drawing operations and is verified for safety, as well as access to the following:

- Appropriate press
- Stock selected for production
- Tongs
- Magnets
- Suction cups
- Rules
- Micrometers
- Verniers
- Squares
- Specialty gages
- Attribute gages
- Process plan

WORK TO BE PERFORMED

Produce parts in the manner prescribed by the process plan.

PERFORMANCE CRITERIA

The parts meet specifications and production and safety practices are appropriate. Paperwork is completed and the time standard is met.

PERFORMANCE ELEMENTS AND ASSESSMENT CRITERIA

- The parts are produced to specifications.
- Appropriate trade techniques are used to produce the parts.
- All relevant paperwork is completed and is in order.
- The work area is returned to a neat and clean state.
- The time standard is met. The time limit is 60 minutes.
- Safe practices are used throughout the performance.

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ADJUST LUBRICATION SYSTEM AND COOLANTS; FILL AND REFILL THE LUBE SYSTEM.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given a machine and tooling with lube systems plus access to the following:

Appropriate press and tooling
Oil, lubricants and coolants
Sight gages
Dipsticks
OEM manuals
Process plan

WORK TO BE PERFORMED

Fill and refill lubrication and coolant reservoirs as necessary. Adjust flow rates for the delivery of lubes and coolants. Perform associated housekeeping and spill containment responsibilities.

PERFORMANCE CRITERIA

Lube and coolant reservoirs are filled. Flow rates meet the requirements of the process, tooling and equipment. Spills and housekeeping responsibilities are discharged appropriately.

PERFORMANCE ELEMENTS AND ASSESSMENT CRITERIA

- **Reservoirs are filled.**
- **Fluids are handled and stored in a manner consistent with safety and environmental requirements.**
- **Flow rates are adjusted to meet the requirements of the process, tooling and equipment.**
- **All relevant questions are answered successfully regarding the performance activity.**
- **Appropriate trade techniques are used to accomplish the work.**
- **All relevant paperwork is completed and is in order.**
- **The work area is returned to a neat and clean state.**
- **The time standard is met. The time limit is 60 minutes.**
- **Safe practices are used throughout the performance.**

INSPECT PART USING A COORDINATE MEASURING MACHINE.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given a finished part, process plan, blueprint and access to the following:

Manual coordinate measuring machine
Finished part matching the blueprint
Tooling appropriate to the presentation of a part on the coordinate measuring machine
Machinery's Handbook

WORK TO BE PERFORMED

Inspect a part's key quality characteristics. Produce data necessary to describe the compliance of the part's characteristics.

PERFORMANCE CRITERIA

The inspection report satisfies the elements of the model report, and appropriate techniques were used to gather the data for the report. Paperwork is complete. Housekeeping is accomplished, safe practices are used and the time standard is met.

PERFORMANCE ELEMENTS AND ASSESSMENT CRITERIA

- The inspection report findings match the findings of the model inspection report.
- Appropriate trade techniques are used to produce the inspection findings.
- All relevant paperwork is completed and is in order.
- The work area is returned to a neat and clean state.
- The time standard is met. The time limit is 60 minutes.
- Safe practices are used throughout the performance.

SET UP AND TEST SAFETY SYSTEMS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given a process plan, setup to be implemented and the following:

Press appropriate to the dies
Personal protective equipment, protective guards and protective devices
Wrenches
Screwdrivers
Assorted hand tools
Rules
Occupational Health and Safety Administration (OSHA) requirements
Process plan

WORK TO BE PERFORMED

Set up and activate all safety systems called for in the process plan. Verify the correct operation and adjustment of the safety systems.

PERFORMANCE CRITERIA

All safety systems called for by practice, OSHA requirements and the process plan are set up. Safe and effective operation of the required safety devices is verified and documented.

PERFORMANCE ELEMENTS AND ASSESSMENT CRITERIA

- Required safety systems are present and function effectively.
- Proper procedures are used to produce the setup.
- Safety documentation is complete.
- All relevant paperwork is completed and is in order.
- The work area is returned to a neat and clean state.
- The time standard is met. The time limit is 60 minutes.
- Safe practices are used throughout the performance.

SET UP AND ADJUST LUBRICATION AND COOLANT SYSTEMS; FILL AND REFILL THE LUBRICANT AND COOLANT SYSTEMS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given a machine and setup with lube and coolant systems, as well as the following:

Appropriate press, tooling and auxiliary equipment
Oil, lubricants and coolants
Lubricant and coolant storage and delivery devices
Sight gages
Dipsticks
OEM manuals
Process plan

WORK TO BE PERFORMED

Set up and test the lube and coolant systems. Fill the lubrication and coolant reservoirs as required by the job specifications and machine and tooling requirements. Set flow rates for the delivery of lubes and coolants. Perform housekeeping and spill containment responsibilities.

PERFORMANCE CRITERIA

Setup and test procedures are followed. Lube and coolant reservoirs are filled. Flow rates meet the requirements of the process, tooling and equipment. Spills and housekeeping responsibilities are discharged appropriately.

PERFORMANCE ELEMENTS AND ASSESSMENT CRITERIA

- Setup procedures are followed.
- Test procedures are followed.
- Reservoirs are filled.
- Fluids are handled and stored in a manner consistent with safety and environmental requirements.
- Flow rates are adjusted to meet the requirements of the process, tooling and equipment.
- All relevant questions are answered successfully regarding the performance activity.
- Appropriate trade techniques are used to accomplish the work.
- All relevant paperwork is completed and is in order.
- The work area is returned to a neat and clean state.
- The time standard is met. The time limit is 60 minutes.
- Safe practices are used throughout the performance.

SET UP MACHINES WITH SINGLE-HIT DIE TOOLING.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Appropriate press
- Stock selected for production
- Tongs
- Magnets
- Suction cups
- Clamps
- Assorted hand tools
- Rules
- Micrometers
- Verniers
- Squares
- Specialty gages
- Attribute gages
- Machinery's Handbook
- Process plan

WORK TO BE PERFORMED

Set up production with single-hit tooling, verify for safety and produce parts in the manner prescribed by the process plan.

PERFORMANCE CRITERIA

The setup satisfies the process plan requirements. The safety devices that control the setup are verified for function and effectiveness. The parts meet specifications, and production and safety practices are appropriate. Paperwork is completed, and the time standard is met.

PERFORMANCE ELEMENTS AND ASSESSMENT CRITERIA

- The setup satisfies the process plan.
- Appropriate trade techniques are used to produce the setup.
- Appropriate trade techniques are used to verify the function of safety devices controlling the setup.
- The parts are produced to specifications.
- All relevant paperwork is completed and is in order.
- The work area is returned to a neat and clean state.
- The time standard is met. The time limit is 60 minutes.
- Safe practices are used throughout the performance.

SET UP MACHINES WITH COMPOUND DIES.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Appropriate press
- Stock selected for production
- Tongs
- Magnets
- Suction cups
- Clamps
- Assorted hand tools
- Rules
- Micrometers
- Verniers
- Squares
- Specialty gages
- Attribute gages
- Machinery's Handbook
- Process plan

WORK TO BE PERFORMED

Set up production using compound dies, verify for safety and produce parts in the manner prescribed by the process plan.

PERFORMANCE CRITERIA

The setup satisfies the process plan requirements. The safety devices that control the setup are verified for function and effectiveness. The parts meet specifications; production and safety practices are appropriate. Paperwork is completed, and the time standard is met.

PERFORMANCE ELEMENTS AND ASSESSMENT CRITERIA

- The setup satisfies the process plan.
- Appropriate trade techniques are used to produce the setup.
- Appropriate trade techniques are used to verify the function of safety devices controlling the setup.
- The parts are produced to specifications.
- All relevant paperwork is completed and is in order.
- The work area is returned to a neat and clean state.
- The time standard is met. The time limit is 60 minutes.
- Safe practices are used throughout the performance.

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SET UP MACHINES WITH NON-SENSORED PROGRESSIVE DIES.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Appropriate press
- Stock selected for production
- Tongs
- Magnets
- Suction cups
- Clamps
- Assorted hand tools
- Rules
- Micrometers
- Verniers
- Squares
- Specialty gages
- Attribute gages
- Machinery's Handbook
- Process plan

WORK TO BE PERFORMED

Set up production using non-sensored progressive dies, verify for safety and produce parts in the manner prescribed by the process plan.

PERFORMANCE CRITERIA

The setup satisfies the process plan requirements. The safety devices that control the setup are verified for function and effectiveness. The parts meet specifications; production and safety practices are appropriate. Paperwork is completed, and the time standard is met.

PERFORMANCE ELEMENTS AND ASSESSMENT CRITERIA

- The setup satisfies the process plan.
- Appropriate trade techniques are used to produce the setup.
- Appropriate trade techniques are used to verify the function of safety devices controlling the setup.
- The parts are produced to specifications.
- All relevant paperwork is completed and is in order.
- The work area is returned to a neat and clean state.
- The time standard is met. The time limit is 60 minutes.
- Safe practices are used throughout the performance.

SET UP MACHINES WITH SENSORED PROGRESSIVE DIES.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Appropriate press
- Stock selected for production
- Tongs
- Magnets
- Suction cups
- Clamps
- Assorted hand tools
- Rules
- Micrometers
- Verniers
- Squares
- Specialty gages
- Attribute gages
- Machinery's Handbook
- Process plan

WORK TO BE PERFORMED

Set up production using sensored progressive dies, verify for safety and produce parts in the manner prescribed by the process plan.

PERFORMANCE CRITERIA

The setup satisfies the process plan requirements. The safety devices that control the setup are verified for function and effectiveness. The parts meet specifications; production and safety practices are appropriate. Paperwork is completed, and the time standard is met.

PERFORMANCE ELEMENTS AND ASSESSMENT CRITERIA

- The setup satisfies the process plan.
- Appropriate trade techniques are used to produce the setup.
- Appropriate trade techniques are used to verify the function of safety devices controlling the setup.
- The parts are produced to specifications.
- All relevant paperwork is completed and is in order.
- The work area is returned to a neat and clean state.
- The time standard is met. The time limit is 60 minutes.
- Safe practices are used throughout the performance.

SET UP MACHINES WITH TRANSFER DIES.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Appropriate press
- Stock selected for production
- Tongs
- Magnets
- Suction cups
- Clamps
- Assorted hand tools
- Rules
- Micrometers
- Verniers
- Squares
- Specialty gages
- Attribute gages
- Machinery's Handbook
- Process plan

WORK TO BE PERFORMED

Set up production using transfer dies, verify for safety and produce parts in the manner prescribed by the process plan.

PERFORMANCE CRITERIA

The setup satisfies the process plan requirements. The safety devices that control the setup are verified for function and effectiveness. The parts meet specifications; production and safety practices are appropriate. Paperwork is completed, and the time standard is met.

PERFORMANCE ELEMENTS AND ASSESSMENT CRITERIA

- The setup satisfies the process plan.
- Appropriate trade techniques are used to produce the setup.
- Appropriate trade techniques are used to verify the function of safety devices controlling the setup.
- The parts are produced to specifications.
- All relevant paperwork is completed and is in order.
- The work area is returned to a neat and clean state.
- The time standard is met. The time limit is 60 minutes.
- Safe practices are used throughout the performance.

SET UP MACHINES WITH SINGLE DEEP-DRAWING OPERATIONS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Appropriate press
- Stock selected for production
- Tongs
- Magnets
- Suction cups
- Clamps
- Assorted hand tools
- Rules
- Micrometers
- Verniers
- Squares
- Specialty gages
- Attribute gages
- Machinery's Handbook
- Process plan

WORK TO BE PERFORMED

Set up production using single deep-drawing tooling, verify for safety and produce parts in the manner prescribed by the process plan.

PERFORMANCE CRITERIA

The setup satisfies the process plan requirements. The safety devices that control the setup are verified for function and effectiveness. The parts meet specifications; production and safety practices are appropriate. Paperwork is completed, and the time standard is met.

PERFORMANCE ELEMENTS AND ASSESSMENT CRITERIA

- The setup satisfies the process plan.
- Appropriate trade techniques are used to produce the setup.
- Appropriate trade techniques are used to verify the function of safety devices controlling the setup.
- The parts are produced to specifications.
- All relevant paperwork is completed and is in order.
- The work area is returned to a neat and clean state.
- The time standard is met. The time limit is 60 minutes.
- Safe practices are used throughout the performance.

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SET UP MACHINES WITH DOUBLE DEEP-DRAWING OPERATIONS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Appropriate press
- Stock selected for production
- Tongs
- Magnets
- Suction cups
- Clamps
- Assorted hand tools
- Rules
- Micrometers
- Verniers
- Squares
- Specialty gages
- Attribute gages
- Machinery's Handbook
- Process Plan

WORK TO BE PERFORMED

Set up production using double deep-drawing tooling, verify for safety and produce parts in the manner prescribed by the process plan.

PERFORMANCE CRITERIA

The setup satisfies the process plan requirements. The safety devices that control the setup are verified for function and effectiveness. The parts meet specifications; production and safety practices are appropriate. Paperwork is completed, and the time standard is met.

PERFORMANCE ELEMENTS AND ASSESSMENT CRITERIA

- The setup satisfies the process plan.
- Appropriate trade techniques are used to produce the setup.
- Appropriate trade techniques are used to verify the function of safety devices controlling the setup.
- The parts are produced to specifications.
- All relevant paperwork is completed and is in order.
- The work area is returned to a neat and clean state.
- The time standard is met. The time limit is 60 minutes.
- Safe practices are used throughout the performance.

SET UP MACHINES WITH REVERSE DEEP-DRAWING OPERATIONS.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given the following:

- Appropriate press
- Stock selected for production
- Tongs
- Magnets
- Suction cups
- Clamps
- Assorted hand tools
- Rules
- Micrometers
- Verniers
- Squares
- Specialty gages
- Attribute gages
- Machinery's Handbook
- Process Plan

WORK TO BE PERFORMED

Set up production using reverse deep-drawing tooling, verify for safety and produce parts in the manner prescribed by the process plan.

PERFORMANCE CRITERIA

The setup satisfies the process plan requirements. The safety devices that control the setup are verified for function and effectiveness. The parts meet specifications; production and safety practices are appropriate. Paperwork is completed, and the time standard is met.

PERFORMANCE ELEMENTS AND ASSESSMENT CRITERIA

- The setup satisfies the process plan.
- Appropriate trade techniques are used to produce the setup.
- Appropriate trade techniques are used to verify the function of safety devices controlling the setup.
- The parts are produced to specifications.
- All relevant paperwork is completed and is in order.
- The work area is returned to a neat and clean state.
- The time standard is met. The time limit is 60 minutes.
- Safe practices are used throughout the performance.

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SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given a setup verified for safety, correct operation of tooling and waste management and access to the following:

- Appropriate press
- Appropriate sample of parts produced by the setup
- Stock selected for production
- Tongs
- Magnets
- Suction cups
- Clamps
- Assorted hand tools
- Rules
- Micrometers
- Verniers
- Squares
- Specialty gages
- Attribute gages
- Machinery's Handbook
- Process plan

WORK TO BE PERFORMED

Verify the sample's conformance to the job specifications for that station.

PERFORMANCE CRITERIA

The verification procedures meet the requirements of the sampling plan. The verification report satisfies the elements of the model report. Appropriate techniques were used to gather the data for the report. Paperwork is complete, housekeeping is accomplished, safe practices are used and the time standard is met.

PERFORMANCE ELEMENTS AND ASSESSMENT CRITERIA

- The verification report findings match the findings of the model verification report.
- The verification procedures meet the requirements of the sampling plan.
- Appropriate trade techniques are used to produce the inspection findings.
- All relevant paperwork is completed and is in order.
- The work area is returned to a neat and clean state.
- The time standard is met. The time limit is 60 minutes.
- Safe practices are used throughout the performance.

SET UP HAND-OFF; COMMUNICATE OPERATING PLAN AND SAFETY REQUIREMENTS TO AN OPERATOR.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Having performed a setup, verified its suitability for production and having access to the following:

- Appropriate press
- Stock selected for production
- Tongs
- Magnets
- Suction cups
- Clamps
- Assorted hand tools
- Rules
- Micrometers
- Verniers
- Squares
- Specialty gages
- Attribute gages
- Machinery's Handbook
- Process plan

WORK TO BE PERFORMED

Communicate the requirements of the operation and its safety systems to an operator. Verify the correct operation of the safety systems for that operator. Make the operator aware of the safety systems, drawings, process plan and the quality control requirements of the job.

PERFORMANCE CRITERIA

The receiving operator executes the operation correctly while interacting appropriately with the safety systems controlling the operation. The operator meets the quality and technical requirements of the job.

PERFORMANCE ELEMENTS AND ASSESSMENT CRITERIA

- The receiving operator executes the production plan correctly.
- The receiving operator interacts with the safety systems appropriately.
- The receiving operator fulfills all requirements and specifications.
- The receiving operator answers relevant questions regarding his or her activities.
- All relevant paperwork is completed and is in order.
- The work area is returned to a neat and clean state.
- The time standard is met. The time limit is 60 minutes.
- Safe practices are used throughout the performance.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given a producing setup verified for safety and access to the following:

- Appropriate press
- Appropriate process monitoring plan
- Stock selected for production
- Tongs
- Magnets
- Suction cups
- Clamps
- Assorted hand tools
- Rules
- Micrometers
- Verniers
- Squares
- Specialty gages
- Attribute gages
- Machinery's Handbook
- Process plan

WORK TO BE PERFORMED

Perform causal analysis on the problems, identifying the problems and their causes.

PERFORMANCE CRITERIA

The operator's analysis matches the model causal chain. The operator's analysis identifies the root cause or causes of the production problem.

PERFORMANCE ELEMENTS AND ASSESSMENT CRITERIA

- The operator analyzes the problem or problems and determines the causal chain.
- The operator determines the root cause or causes of the problems.
- The operator documents his or her findings.
- The operator answers relevant questions regarding his or her findings.
- All relevant paperwork is completed and is in order.
- The work area is returned to a neat and clean state.
- The time standard is met. The time limit is 60 minutes.
- Safe practices are used throughout the performance.

SKILL STANDARD

CONDITIONS OF PERFORMANCE

Given a ready-to-run setup, job specifications and access to the following:

- Appropriate press
- Appropriate hand-off instructions from a setup person
- Stock selected for production
- Tongs
- Magnets
- Suction cups
- Clamps
- Assorted hand tools
- Rules
- Micrometers
- Verniers
- Squares
- Specialty gages
- Attribute gages
- Machinery's Handbook
- Process plan

WORK TO BE PERFORMED

Verify the correct function and adjustment of all related safety systems.

PERFORMANCE CRITERIA

All safety systems function effectively as determined by practice, Occupational Safety and Health Administration (OSHA) requirements or process plan. Related safety documentation is complete.

PERFORMANCE ELEMENTS AND ASSESSMENT CRITERIA

- The operator tests and verifies the operation of each safety device or system.
- The operator adjusts each device or system to operate to specifications.
- The operator documents the operation of the safety devices and safety systems.
- The operator answers relevant questions regarding his or her findings.
- All relevant paperwork is completed and is in order.
- The work area is returned to a neat and clean state.
- The time standard is met. The time limit is 60 minutes.
- Safe practices are used throughout the performance.

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Academic Skills	Skills (and related knowledge) contained in the subject areas and disciplines addressed in most national and state educational standards, including English, mathematics, science, etc.
Assessment	A process of measuring performance against a set of standards through examinations, practical tests, performance observations and/or the completion of work portfolios.
Content Standard	A specification of what someone should know or be able to do to successfully perform a work activity or demonstrate a skill.
Critical Work Functions	Distinct and economically meaningful sets of work activities critical to a work process or business unit which are performed to achieve a given work objective with work outputs that have definable performance criteria. A critical work function has three major components: • **Conditions of Performance:** The information, tools, equipment and other resources provided to a person for a work performance. • **Work to Be Performed:** A description of the work to be performed. • **Performance Criteria:** The criteria used to determine the required level of performance. These criteria could include product characteristics (e.g., accuracy levels, appearance), process or procedure requirements (e.g., safety, standard professional procedures) and time and resource requirements. The IOSSCC requires that these performance criteria be further specified by more detailed individual performance elements and assessment criteria.
Credentialing	The provision of a certificate or award to an individual indicating the attainment of a designated set of knowledge and skills and/or the demonstration of a set of critical work functions for an industry/ occupational area.
Illinois Occupational Skill Standards and Credentialing Council (IOSSCC)	Legislated body representing business and industry which establishes skill standards criteria, endorses final products approved by the industry subcouncil and standards development committee and assists in marketing and dissemination of occupational skill standards.
Industry	Type of economic activity, or product or service produced or provided in a physical location (employer establishment). They are usually defined in terms of the Standard Industrial Classification (SIC) system.

Industry Subcouncil	Representatives from business/industry and education responsible for identifying and prioritizing occupations for which occupational performance skill standards are adapted, adopted or developed. They establish standards development committees and submit developed skill standards to the IOSSCC for endorsement. They design marketing plans and promote endorsed skill standards across the industry.
Knowledge	Understanding the facts, principles, processes, methods and techniques related to a particular subject area, occupation or industry.
Occupation	A group or cluster of jobs, sharing a common set of work functions and tasks, work products/services and/or worker characteristics. Occupations are generally defined in terms of a national classification system including the Standard Occupational Classification (SOC), Occupational Employment Statistics (OES) and the Dictionary of Occupational Titles (DOT).
Occupational Cluster	Grouping of occupations from one or more industries that share common skill requirements.
Occupational Skill Standards	Specifications of content and performance standards for critical work functions or activities and the underlying academic, workplace and occupational knowledge and skills needed for an occupation or an industry/occupational area.
Occupational Skills	Technical skills (and related knowledge) required to perform the work functions and activities within an occupation.
Performance Standard	A specification of the criteria used to judge the successful performance of a work activity or the demonstration of a skill.
Product Developer	Individual contracted to work with the standard development committee, state liaison, industry subcouncil and IOSSCC for the adaptation, adoption or development of skill standards content.
Reliability	The degree of precision or error in an assessment system so repeated measurements yield consistent results.
Skill	A combination of perceptual, motor, manual, intellectual and social abilities used to perform a work activity.
Skill Standard	Specifies the knowledge and competencies required to perform successfully in the workplace.

Standards Development Committee	Incumbent workers, supervisors and human resource persons within the industry who perform the skills for which standards are being developed. Secondary and postsecondary educators are also represented on the committee. They identify and verify occupational skill standards and assessment mechanisms and recommend products to the industry subcouncil for approval.
State Liaison	Individual responsible for communicating information among all parties (IOSSCC, subcouncil, standard development committee, product developer, project director, etc.) in skill standard development.
Third-Party Assessment	An assessment system in which an industry-designated organization (other than the training provider) administers and controls the assessment process to ensure objectivity and consistency. The training provider could be directly involved in the assessment process under the direction and control of a third-party organization.
Validity	The degree of correspondence between performance in the assessment system and job performance.
Workplace Skills	The generic skills essential to seeking, obtaining, keeping and advancing in any job. These skills are related to the performance of critical work functions across a wide variety of industries and occupations including problem solving, leadership, teamwork, etc.

Margaret Blackshere	AFL-CIO
David Emerson	Downstate National Bank
Michael O'Neill	Chicago Building Trades Council
Janet Payne	United Samaritans Medical Center
Gerald Schmidt	Illinois Manufacturing Association Caterpillar, Inc.
Jim Schultz	Illinois Retail Merchants Association Walgreen Company
Larry Vaughn	The Illinois State Chamber of Commerce Alternative School Network

Blouke Carus	President and Chief Executive Officer Carus Corporation
Gerson Ecker	Becker-Erhardt Company
George Knecht	Subdistrict Director United Steelworkers of America
Ken Knott	Business Agent District 9 Machinists
Steve Kopinski	General Manager Abrasive Form, Inc.
Harry Litchfield	Deere & Company
Renee Loth	LoDan Electronics, Inc.
George Marshall	Hoffer Plastics
Bob Shaw	Lewis and Clark College
Norm Sherck	Information Staff Representative United Auto Workers
Gary Smith	General Manager Manufacturers' Brass and Aluminum Foundry
Norbert Stengel	President Northwestern Tool & Die Manufacturing Corporation
Gabe Verstraete	United Township High School
Marvin Wortell	Chairman Triton Industries, Inc.
Peter Wrenn	President Hudson Screw Machine Products Company
Diane Yasko	Motorola, Inc.

Ronald Engstrom	State Liaison Illinois State Board of Education
Dennis Gallo	State Liaison Illinois State Board of Education

I. Occupational Definition and Justification

A. Occupational Definition

The Manufacturing Subcouncil identified metal stamping skills as a major occupational cluster in manufacturing. Metal stamping refers to a broad range of metalworking operations such as shearing, piercing, punching and staking, as well as forming operations such as braking and drawing. These operations may be performed using manual equipment or complex progressive die sets mounted in presses. Metal stamping skills include planning, setup, verification of proper operation and production of semi-finished and finished goods. Although there are many different types of stamping presses in the industry, skill differences are determined by the types of tooling and ancillary devices used in the stamping process.

The National Institute for Metalworking Skills (NIMS) has developed national standards for two levels of stamping skills. The Manufacturing Subcouncil voted to endorse these national standards for Illinois as reformatted to meet the format requirements of the Illinois Occupational Skill Standards and Credentialing Council (IOSSCC).

The IOSSCC-recognized standards will be referred to as the "National Duties and Standards for Metalforming Skills Metal Stamping, Levels II and III, approved by the National Institute for Metalworking Skills, to meet the format requirements of the Illinois Occupational Skill Standards and Credentialing Council."

These stamping skills are used predominately in the following occupations recognized by the Tooling and Manufacturing Association in their analysis of labor market needs in Illinois.

- Punching Machine Setters and Set-Up Operators
- Machine Forming Operators and Tenders
- Press Machine Setters and Set-Up Operators
- Combination Machine Setters and Set-Up Operators
- Combination Machine Tool Operators and Tenders

B. Employment and Earnings Opportunities

These metal stamping occupations have a generally favorable employment outlook in Illinois according to the Illinois Occupational Information Coordinating Committee (IOICC) based on data provided by the Tooling and Manufacturing Association and the Illinois Department of Employment Security. These metal stamping occupations are projected to have a large number of job openings in the future due to growth and replacement needs.

The IOICC concludes that there will be increased opportunities (and perhaps a shortage) for highly skilled workers. National and local sources indicate that employers continue to experience widespread difficulties in finding skilled workers to hire for these and other metalworking positions. Over 500 job openings are projected each year, mostly in the greater Chicago area.

These machining occupations also meet the IOSSCC earnings criteria based on data provided by the IOICC and shown below:

	*Middle Range Annual Earnings, 1995**
• Punching Machine Setters and Set-Up Operators	$23,190 - $28,200
• Machine Forming Operators and Tenders	$15,600 - $21,500
• Press Machine Setters and Set-Up Operators	$20,700 - $27,560
• Combination Machine Tool Setters and Set-Up Operators	$19,050 - $26,200
• Combination Machine Tool Operators and Tenders	$15,900 - $22,200

**Middle Range is the middle 50%, i.e., one-fourth of persons in the occupation earn below the bottom of the range and one-fourth of persons in the occupation earn above the top of the range.*

C. Career Opportunities and Education and Training Requirements

Metal stamping skills meet the IOSSCC criteria for education and training requirements and career opportunities. Metal stamping skills require basic workplace skills and advanced technical training for both skill levels. The workplace skill requirements are detailed in the knowledge, skills and other attributes provided in the standards document. The technical skill requirements are detailed in the technical elements portion of the standards document.

II. Occupational Standards and Credentials

A. Occupational Standards

The Metal Stamping Levels II and III developed by the NIMS meet all IOSSCC content requirements and have been translated into the IOSSCC format. The translation to IOSSCC formats required no major changes in the national standards.

B. Assessment and Credentialing System

The National Institute for Metalworking Skills (NIMS) is developing both written and performance examinations for Metal Stamping, Levels II and III. These examinations will be developed and pilot-tested and will be available for use in Illinois. The assessment and credentialing process meets all IOSSCC criteria.

III. Industry Support and Commitment

A. Industry Commitment for Development and Updating

The National Institute for Metalworking Skills conducted a national validation of the national metal stamping skill standards through regional technical groups and national surveys. The Manufacturing Subcouncil established a standards development committee to approve the national standards and the reformatting of the standards. This committee received a mail survey with the reformatted standards. The survey returns recommended endorsement of the national standards and approval of the reformatting. The Manufacturing Subcouncil then voted to endorse the national standards as reformatted.

NIMS is committed to maintaining and updating the national machining skill standards for use in Illinois and other states. The NIMS board is composed of representative groups of leading industry and trade associations and unions in the industry.

B. Industry Commitment for Marketing

NIMS and affiliated Illinois organizations are committed to promoting and marketing the national metal stamping standards and credentialing system in Illinois. Letters from NIMS and the Tooling and Manufacturing Association indicating their commitment are available upon request from the Illinois State Board of Education.

A. Developing an Employment Plan	1. Match interests to employment area. 2. Match aptitudes to employment area. 3. Identify short-term work goals. 4. Match attitudes to job area. 5. Match personality type to job area. 6. Match physical capabilities to job area. 7. Identify career information from counseling sources. 8. Demonstrate a drug-free status.
B. Seeking and Applying for Employment Opportunities	1. Locate employment opportunities. 2. Identify job requirements. 3. Locate resources for finding employment. 4. Prepare a resume. 5. Prepare for job interview. 6. Identify conditions for employment. 7. Evaluate job opportunities. 8. Identify steps in applying for a job. 9. Write job application letter. 10. Write interview follow-up letter. 11. Complete job application form. 12. Identify attire for job interview.
C. Accepting Employment	1. Apply for social security number. 2. Complete state and federal tax forms. 3. Accept or reject employment offer. 4. Complete employee's Withholding Allowance Certificate Form W-4.
D. Communicating on the Job	1. Communicate orally with others. 2. Use telephone etiquette. 3. Interpret the use of body language. 4. Prepare written communication. 5. Follow written directions. 6. Ask questions about tasks.
E. Interpreting the Economics of Work	1. Identify the role of business in the economic system. 2. Describe responsibilities of employee. 3. Describe responsibilities of employer or management. 4. Investigate opportunities and options for business ownership. 5. Assess entrepreneurship skills.
F. Maintaining Professionalism	1. Participate in employment orientation. 2. Assess business image, products and/or services. 3. Identify positive behavior. 4. Identify company dress and appearance standards. 5. Participate in meetings in a positive and constructive manner. 6. Identify work-related terminology. 7. Identify how to treat people with respect.

G. Adapting to and Coping with Change	1. Identify elements of job transition. 2. Formulate transition plan. 3. Identify implementation procedures for a transition plan. 4. Evaluate the transition plan. 5. Exhibit ability to handle stress. 6. Recognize need to change or quit a job. 7. Write a letter of resignation.
H. Solving Problems and Critical Thinking	1. Identify the problem. 2. Clarify purposes and goals. 3. Identify solutions to a problem and their impact. 4. Employ reasoning skills. 5. Evaluate options. 6. Set priorities. 7. Select and implement a solution to a problem. 8. Evaluate results of implemented option. 9. Organize workloads. 10. Assess employer and employee responsibility in solving a problem.
I. Maintaining a Safe and Healthy Work Environment	1. Identify safety and health rules/procedures. 2. Demonstrate the knowledge of equipment in the workplace. 3. Identify conservation and environmental practices and policies. 4. Act during emergencies. 5. Maintain work area. 6. Identify hazardous substances in the workplace.
J. Demonstrating Work Ethics and Behavior	1. Identify established rules, regulations and policies. 2. Practice cost effectiveness. 3. Practice time management. 4. Assume responsibility for decisions and actions. 5. Exhibit pride. 6. Display initiative. 7. Display assertiveness. 8. Demonstrate a willingness to learn. 9. Identify the value of maintaining regular attendance. 10. Apply ethical reasoning.
K. Demonstrating Technological Literacy	1. Demonstrate basic keyboarding skills. 2. Demonstrate basic knowledge of computing. 3. Recognize impact of technological changes on tasks and people.
L. Maintaining Interpersonal Relationships	1. Value individual diversity. 2. Respond to praise or criticism. 3. Provide constructive praise or criticism. 4. Channel and control emotional reactions. 5. Resolve conflicts. 6. Display a positive attitude. 7. Identify and react to sexual intimidation/harassment.
M. Demonstrating Teamwork	1. Identify style of leadership used in teamwork. 2. Match team member skills and group activity. 3. Work with team members. 4. Complete a team task. 5. Evaluate outcomes.

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